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EXAMINER

CHU, HELEN OK

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1745

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/509,747	Applicant(s) INOKUCHI ET AL.	
	Examiner Helen O. Chu	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11 April 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-6 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-6 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. Applicant's Remarks/Arguments has been received on April 4, 2007.
2. The text of those sections of Title 35, U.S.C. code not included in this action can be found in the prior Office Action.

Specification

3. The disclosure objected is maintained. For purposes of convenience the objection is repeated below.
4. The disclosure is objected to under 37 CFR 1.71, as being so incomprehensible as to preclude a reasonable search of the prior art by the examiner. For example, the following items are not understood: $90 < Y + 50.5X < 100$ where Y at highest is 1.0 J/g and X at highest is 1.75 g/cm³ does not satisfy the expression requirement.

Applicant is required to submit an amendment which clarifies the disclosure so that the examiner may make a proper comparison of the invention with the prior art.

Claim Rejections - 35 USC § 112

5. The rejections under 35 U.S.C 112, first paragraph, on claims 1-6 are maintained. The rejection is repeated below for convenience.
6. The rejections under 35 U.S.C 112, first paragraph, on claims 2 and 3 are maintained. The rejection is repeated below for convenience.
7. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the

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art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 1-6 rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a carbon rod density of 1.68 g/cm^3 and a paraffin wax of 389 molecular weight at a melting point of 135°F , a carbon rod density of 1.65 with either a paraffin wax of 431 molecular weight at a melting point of 145°F or a paraffin wax of 472 molecular weight at a melting point of 155°F is not reasonably provide enablement for paraffin wax containing hydrocarbon whose molecular weight is 300 to 500 or a microcrystalline wax containing hydrocarbon whose molecular weight is 500-800 and a carbon density of $1.55\text{-}1.75 \text{ g/cm}^3$. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make the invention commensurate in scope with these claims. The claim recitation would cause undue experimentation by measuring wax containing different amounts of hydrocarbon relative to the density of the carbon rod in order to obtain 1.0 J/g . As evidence by Table 1, provided by the Applicant, the higher density and lower molecular weight or lower density and higher molecular weight would provide an endothermic amount less than 1.0 J/g . However, a comparison between a carbon rod of 'high' density (Example 1) and 'low' density (Comparative Example 1), a difference of 0.03 g/cm^3 using the same paraffin wax causes significant changes in endothermic amounts. It is unclear to the Examiner or any one of ordinary skill with which combinations of hydrogen molecular weight of paraffin wax and density in carbon rod would cause an endothermic amount of less than 1.0 J/g . For example, would a carbon rod density of 1.66 or 1.67 g/cm^3 and a wax with a hydrocarbon molecular weight of 400

be sufficient to provide an exothermic amount of less than 1.0J/g. *In re Wands*, 858 F. 2d 731, 8 USPQ2d 1400 (Fed. Cir. 1988)

9. Claim 2 and 3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rational expression provided does not provide the Examiner or anyone of ordinary skill to formulate coherent understanding. The expression provided is $90 < Y + 50.5x < 100$, where Y is the specific energy having units of J/g and X is the density having units of g/cm^3 does not correlate X and Y with each other in this equation. Y and X have two different units and therefore are not combinable.

10. Claim 2 and 3 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. The rational expression provided does not provide the Examiner or anyone of ordinary skill to formulate coherent understanding. The expression provided is $90 < Y + 50.5x < 100$, where Y being the highest number of 1.0 and X being the highest number of 1.75 does not provide a value greater than 90 and less than 100. Therefore, the Examiner cannot further prosecute claims 2 and 3.

11. Claims depending from claims 1, 2 and 6 rejected under 35 USC 112, first paragraph are also rejected for the same reasons.

12. The rejections under 35 U.S.C 112, second paragraph, on claims 1-6 are maintained. The rejection is repeated below for convenience.

13. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

14. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "endothermic amount" is unclear to the Examiner. It is unclear to anyone of ordinary skill what the endothermic amount defines.

15. Claims 1-6 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The recitation "endothermic amount" is unclear to the Examiner. It is unclear to anyone of ordinary skill what the endothermic amount defines and why at different scanning calorimetry range it would give less than 1.0J/g and the higher the range the more percent of endothermic amounts but still less than 1.0J/g. How is an amount less than 1.0J/g more significant than 1.1 J/g? The Applicant must provide this information before the Examiner withdraws 35 U.S.C 112, second paragraph rejection.

16. Claims depending from claims 1, 2, 4-6 rejected under 35 USC 112, second paragraph are also rejected for the same reasons.

Claim Rejections - 35 USC § 103

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17. The rejections under 35 U.S.C 103(a), as unpatentable over Nobuaki in view of Nagasawa et al. , on claims 1, 4-6 are maintained. The rejection is repeated below for convenience.

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

19. Claims 1, 4-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nobuaki (JP 03297063) in view of Nagasawa et al. (US Patent 4,157,317).

In regards to claim 1 and 6, the Nobuaki reference discloses an impregnation material for carbon rod in a manganese dry cell. The abstract describes paraffin wax as the impregnation material consisting hydrocarbon of 300-500 molecular weight, however, the Nobuaki et al. does not disclose the density of the carbon rod. The Nagasawa et al. reference discloses wax impregnation of a carbon rod and the density of the carbon rod is between 1.6-1.8 g/cm³. The Nagasawa et al. reference further discloses below 1.6 g/cm³ density does not provide sufficient strength and higher than 1.8 g/cm³ does not easily allow the gases to escape the rod during heating and cracks (on the rod) is likely to occur (Column 5, lines 5-12). Therefore, it would have been obvious to one of the ordinary skill in the art at the time of the invention to apply the wax with hydrocarbons with a molecular weight of 300-500 as taught by Nobuaki to the carbon rod with a density between 1.6-1.8 g/cm³ as taught by Nagasawa et al. to prevent the rod from cracks due to heating and providing a longer life to the manganese

dry cell. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. (*MPEP 2144.05 (I)*)

Regarding claims 4 and 5, the endothermic amount indicated by Applicants as not more than 1.0 J/g obtained by differential scanning calorimetry between 20 to 55°C is not more than 25%, 20 to 60°C is between 25% to 40%, 20 to 65°C is between 40% to 70% are all intrinsic properties of the paraffin wax having a molecular weight of 300 to 500.

Applicant is advised to prove all of the different combinations of the carbon rod density and the wax of different hydrocarbon amounts as taught by the prior art would not provide an endothermic amount of less than 1.0 J/g.

Response to Arguments

20. Applicant's arguments filed April 11, 2007 have been fully considered but they are not persuasive.

Applicant's principal arguments are:

A) Regarding specification objection: 1.0 J/g is the endothermic amount from only the range of 20-45°C, not the range of 20-100 °C. This relationship is clearly understood by one skill in the art in light of the teaching in the specification

B) Regarding 35 U.S.C. 112, first paragraph, rejection on claims 1-6: One of ordinary skill in the art would have recognize that the full scope of the claims is enabled. Measurements of density, and endothermic properties via DSC are well known and the common measurement and analysis techniques that are well within the abilities of one skill in the art. The Office Action appears to assert that the properties of the positive

current collectors are unpredictable. However, such unpredictability rather than supporting the Office Actions' assertions of lack of enablement, actually supports Applicant's position that the claimed invention is not obvious

C) Regarding 35 U.S.C. 112, first paragraph, rejection on claims 2 and 3:

First, there is no requirement that the units of the claimed relationship must be the same. Contrary to the Office Action's assertion, the numerical values of X and Y can be summed and as long as the sum of Y and $50.5 X$ fall between 90 to 100, the limitation is met.

D) Regarding 35 U.S.C. 112, first paragraph, rejection on claims 2 and 3: 1.0

J/g is the endothermic amount for only the range of 20-45°C, not the range of 20-100°C.

E) Regarding 35 U.S.C. 112, second paragraph, rejection on claims 1-6;

"endothermic amount" is the amount of thermal energy (Joules) absorbed by the sample as the sample temperature raised from 20 to 100°C

F) Regarding 35 U.S.C. 103(a) rejection on claims 1, 4-6; Nobuaki and

Nagasawa et al., whether taken alone or in combination, do not suggest the claimed positive electrode current collector. The PTO's apparent attempt to place the burden of disproving all the prior art examples on Applicants is improper. If the PTO maintains this position, Applicants request the PTO point out on what basis such a requirement can be made. Table 1 of the present specification proves that waxes having the claimed molecular weight and carbon rods with the claimed density do not inherently produce positive electrode current collectors with the claimed endothermic amount. It is not

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necessary, when rebutting an obviousness rejection, to prove that all the prior art examples do not possess the claimed property. Rather, the PTO has the burden of establishing a prima facie case of obviousness, and if the Office Action does so, then Applicants have the burden of rebutting the conclusion of obviousness. Applicants do not have the burden of proving all the prior art examples do not possess the claimed property.

Furthermore, claims are to be considered as a whole, and when all the limitations are considered as a whole, the claimed positive electrode current collector would not have been obvious. In particular, the cited references do not suggest the unexpected improvement in discharge performance provided by positive electrode current collectors of the present invention, as illustrated in Table 11

Obviousness can be established only by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Kotzab, 217 F.3d 1365, 1370 55 USPQ2d 1313, 1317 (Fed. Cir. 2000); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992); In re Fine, F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988). There is no suggestion in Nobuaki and Nagasawa et al. to substitute a wax wherein an endothermic amount of the paraffin wax or the microcrystalline wax obtained by differential scanning calorimetry at 20 to 45°C is not more than 1.0 J/g, and a carbon rod having a density of 1.55 to 1.75 g/cm³ into the current collector of Nobuaki, as required by claims 1 and 6. The only teaching of a positive current collector with the claimed wax and carbon rod

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density is found in Applicants' disclosure. However, the teaching or suggestion to make a claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). The PTO has apparently relied on improper hindsight reasoning in reaching the conclusion of obviousness.

In response to Applicant's arguments please consider the following:

A) When 1.0J/g is replaced into the expression $90 < Y + 50.5X < 100$ as the variable Y and X is 1.75 g/cm^3 . The expression does not make sense. Even one of ordinary skill would not be able to understand this expression. Second, 20-45 °C is within the range of 20-100°C and therefore applying 1.0J/g for Y and X as 1.75 g/cm^3 is reasonable especially when it is incorporated in the claim language ~~the claimed language~~. Y was provided in the claimed language and X is provided in the specification on page 7; the Examiner took 1.75 g/cm^3 , the highest value possible in attempt to make the expression reach the range of 90-100. This has failed to satisfy the expression.

B) The specification, while being enabling for a carbon rod density of 1.68 g/cm^3 and a paraffin wax of 389 molecular weight at a melting point of 135 °F, a carbon rod density of 1.65 with either a paraffin wax of 431 molecular weight at a melting point of 145°F or a paraffin wax of 472 molecular weight at a melting point of 155°F is not reasonably provide enablement for paraffin wax containing hydrocarbon whose molecular weight is 300 to 500 or a microcrystalline wax containing hydrocarbon whose molecular weight is 500-800 and a carbon density of $1.55\text{-}1.75 \text{ g/cm}^3$. **The specification does not enable any person skilled in the art to which it pertains, or**

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with which it is most nearly connected, to make the invention commensurate in scope with these claims. The claim recitation would cause undue experimentation by measuring wax containing different amounts of hydrocarbon relative to the density of the carbon rod in order to obtain 1.0J/g. As evidence by Table 1, provided by the Applicant, the higher density and lower molecular weight or lower density and higher molecular weight would provide an endothermic amount less than 1.0J/g. However, a comparison between a carbon rod of 'high' density (Example 1) and 'low' density (Comparative Example 1), a difference of 0.03 g/cm³ using the same paraffin wax causes significant changes in endothermic amounts. It is unclear to the Examiner or any one of ordinary skill with which combinations of hydrogen molecular weight of paraffin wax and density in carbon rod would cause an endothermic amount of less than 1.0J/g. For example, would a carbon rod density of 1.66 or 1.67 g/cm³ and a wax with a hydrocarbon molecular weight of 400 be sufficient to provide an exothermic amount of less than 1.0J/g.

C) There is a requirement for the units to be the same if one of skilled in the art were to sum the expression. As an example, if the units are not the same; let's use X to be oranges and Y to be temperature. How can anyone skilled in the art put X and Y in to the expression and be expected to sum the expression. Let's put X as oranges into the expression and Y as temperature; $90 < Y + 50.5X < 100$ the expression becomes $90 < 45^{\circ}\text{C} + 50.5 (\text{oranges}) < 100$. How does one of ordinary skill in the art sum this expression? This is equivalent with X and Y's having different units.

D) Again, when 1.0J/g is replaced into the expression $90 < Y + 50.5X < 100$ as the variable Y and X is 1.75 g/cm^3 . The expression does not make sense. Even one of ordinary skill would not be able to understand this expression. Second, 20-45 °C is within the range of 20-100°C and therefore applying 1.0J/g for Y and X as 1.75 g/cm^3 is reasonable especially when it is incorporated in the claim language. Y was provided in the claimed language and X is provided in the specification on page 7; the Examiner took 1.75 g/cm^3 , the highest value possible in attempt to make the equation reach the range of 90-100. This has failed to satisfy the expression.

E) The explanation does not clarify the confusion. Another way of putting this, what amount is the endothermic amount for the present invention

F) The Patent and Trademark Office can require applicants to prove that prior art products do not necessarily or inherently possess characteristics of claimed products where claimed and prior art products are identical or substantially identical, or are produced by identical or substantially identical processes; burden of proof is on applicants where rejection based on inherency under 35 U.S.C. § 102 or on prima facie obviousness under 35 U.S.C. § 103, jointly or alternatively, and Patent and Trademark Office's inability to manufacture products or to obtain and compare prior art products evidences fairness of this rejection, *In re Best, Bolton, and Shaw*, 195 USPQ 431 (CCPA 1977).

Under Section 103, the obviousness of an invention cannot be established by combining the teachings of the prior art references absent some teaching, suggestion or incentive supporting the combination. *ACS Hospital Systems, Inc. v. Montefiore*

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Hospital, 732 F.2d 1572, 1577, 221 USPQ 929, 933 (Fed. Cir. 1984). This does not mean that the cited prior art references must specifically suggest making the combination. *B.F. Goodrich Co. M Aircraft Braking Systems Corp.*, 72 F.3d 1577, 1582, 37 USPQ2d 1314, 1318 (Fed. Cir. 1996); *In re Nilssen*, 851 F.2d 1401, 1403, 7 USPQ2d 1500, 1502 (Fed. Cir. 1988)). Rather, the test for obviousness is what the combined teachings of the prior art references would have suggested to those of ordinary skill in the art. *In re Young*, 927 F.2d 588, 591, 18 USPQ2d 1089, 1091 (Fed. Cir. 1991); *In re Keller*, 642 F.2d 413, 425, 208 USPQ 871, 881 (CCPA 1981). This test requires us to take into account not only the specific teachings of the prior art references, but also any inferences which one skilled in the art would reasonably be expected to draw therefrom. *In re Preda*, 401 F.2d 825, 826, 159 USPQ 342, 344 (CCPA 1968).

Furthermore, in response to Applicant's arguments that the Examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the Applicant's disclosure, such a reconstruction is proper. *In re McLaughline*, 443 F.2d 1392; 170 USPQ 209 (CCPA 1971)

Conclusion

21. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Helen O. Chu whose telephone number is (571) 272-5162. The examiner can normally be reached on Monday-Friday 8am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



PATRICK JOSEPH RYAN
SUPERVISORY PATENT EXAMINER

HOC